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bad, the farmer is greatly restricted in the times when he can go to market. If high prices coincide with a period of wet weather and deep mud, the farmer may lose his opportunity of getting his crops to market. In France, cold or stormy days are often used for hauling to market, but American farmers usually have to use for hauling the days which are the best for work on the farm. Railroad receipts often suffer a serious falling off when the weather is severe, and when the country roads are in such condition that farmers can not haul their produce to the train.

#### MONTHLY WEATHER REVIEW.

THE *Monthly Weather Review* for September, 1904 (dated November 19), contains the following articles of general interest: H. Elias, 'A New Theory of Fog Formation' (translated from the German); J. H. Spencer, 'Three Notable Meteorological Exhibits at the World's Fair' (the U. S. Weather Bureau, the German and the Philippine Weather Bureau exhibits); and the following notes: 'Meteorology in Roumania'; 'Observations for Twelve Months in Lassa' (data obtained by M. Tysbikov, a Russian, who resided in Lassa from August 15, 1900, to August 22, 1901); 'Observations at the Franco-Scandinavian Station for Aerial Soundings' (from *Comptes Rendus*); 'Wind Velocity and Ocean Waves' (from a recent paper by Cornish).

#### NO SECULAR CHANGE OF CLIMATE IN TRIPOLI.

VICOMTE DE MATHUSIEULX, in an account of his expedition to Tripoli (*Bull. Amer. Geogr. Soc.*, December, 1904), states it as his opinion that there is no reason for supposing any secular change of climate to have occurred in that region, although others have taken the opposite view. The Latin texts and monuments seem, to this writer, to establish the fact that so far as the atmosphere and soil are concerned, everything is just as it was in antiquity. The present condition of the country is ascribed to the idleness of the Arabs, who have allowed innumerable wells to become choked and the vegetation to perish. "In a country so little favored by nature, the first requisite is a diligent and hard-working

population. The Romans took several centuries to make the land productive by damming the ravines and sinking wells in the *wady* beds."

#### CLIMATIC CHANGE IN THE LAKE CHAD REGION.

THE evidence from the region between the Ubangi River and Lake Chad, studied by M. Aug. Chevalier in 1902-3, is, however, believed to point towards a progressive desiccation there (*La Geographie*, May, 1904). M. Chevalier thinks it probable that a great river once flowed north across the Sahara to the Mediterranean, and that Lake Chad was merely a back water. Vegetable and animal remains indicate an invasion of the Sudan by the Saharan climate, and Neolithic relics indicate the former presence of prosperous communities. The change is not a regularly progressive one, for Lake Chad sometimes spreads beyond its usual bed as a result of several years of heavy rainfall. Since 1897 the waters have continued to fall. After a drought in 1902, Lake Fittri dried up in the following year, and hippopotami which inhabited it went elsewhere.

#### KITE METEOROLOGY OVER LAKE CONSTANCE.

DR. HERGESELL has contributed to a recent number of the *Beiträge zur Physik der freien Atmosphäre* an account of the observations made by him with kites on the Lake of Constance, the flights being made from a motor-boat, loaned by Count Zeppelin, during the years 1900, 1902 and 1903. The observations show that inversions of temperature and of humidity frequently occur in the free air which are not exhibited by the observations made at mountain observatories.

R. DEC. WARD.

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#### THE FIRST OBSERVATIONS WITH 'BALLONS-SONDES' IN AMERICA.

As is known to many readers of SCIENCE, there have been despatched in Europe frequently during the past ten years *ballons-sondes*, or small balloons carrying only instruments that record automatically the temperature and pressure of the air, thus enabling the

temperatures to be determined at the successive heights reached, the place and time at which the balloons fall indicating approximately the direction and velocity of the upper currents. The 'aeronautical concourse' of the St. Louis Exposition afforded an opportunity to undertake these investigations in this country. Accordingly, the work was taken up by Mr. A. Lawrence Rotch, director of the Blue Hill Observatory, in cooperation with Col. J. A. Ockerson, chief of the Department of Liberal Arts at the Exposition, and a series of very satisfactory experiments has just been completed.

The balloons used in the experiments are the closed rubber balloons devised by Dr. Assmann, director of the Prussian Aeronautical Observatory. These balloons are inflated with about 100 cubic feet of hydrogen gas; they expand in rising until they burst, and then the attached parachute moderates the fall. In some cases two balloons, coupled tandem, were employed, and, as only one balloon bursts, the other is borne slowly to the ground and serves to attract attention. The instruments, which were furnished by M. Teisserenc de Bort, of Paris, record the temperature and barometric pressure upon a smoked cylinder, turned by clockwork; and the lightest of them in its basket weighs about one and one half pounds. A notice attached to each requests the finder to pack the instrument carefully in a box and return either to St. Louis or to Blue Hill, with promise of a reward for the service.

Owing to delays in obtaining the gas and apparatus, the experiments were not begun until the middle of September, during which month four ascensions took place. All of the balloons fell within a radius of fifteen miles, about fifty miles east of St. Louis. Twice the height of nine or ten miles was attained where a temperature of 68° F. below zero was recorded. These experiments were conducted by Mr. S. P. Fergusson, of the Blue Hill Observatory staff. Another series of ten ascensions was executed by Mr. H. H. Clayton, meteorologist at the Blue Hill Observatory, during the last part of November and the first days of December, mostly after sunset, in order to avoid the possible effect of insolation.

Fortunately, all these balloons were also recovered, though the stronger upper air currents carried them further from St. Louis, three of them traveling more than two hundred miles, and two, at least, with a speed exceeding one hundred miles an hour, the direction of every balloon being toward the easterly semi-circle. Ten of the fourteen ascensions furnished good records, and the reduction of the later ones reveals lower temperatures than in September, for example, 72° below zero at the height of seven and three quarters miles on November 25, and 76° below at six and one quarter miles on the following day.

The fact that all the balloons were recovered indicates the excellent topographical situation of St. Louis for despatching them, and Mr. Rotch expects to make another series of ascensions there this month, in order to obtain the temperatures of the upper air in mid-winter.

#### SCIENTIFIC NOTES AND NEWS.

THE Lavoisier medal of the Paris Academy of Sciences has been awarded to Sir James Dewar.

THE title of Correspondant de l'Ecole d'Anthropologie de Paris has been conferred upon Mr. George Grant MacCurdy of the Yale University Museum.

MR. FREDERIC EMORY, chief of the Bureau of Trade Relations of the Department of State, has presented his resignation to take effect on March 31.

DR. HORACE JAYNE has resigned the directorship of the Wistar Institute of the University of Pennsylvania.

LORD KELVIN has accepted the nomination of the council for the presidency of the London Faraday Society, in succession to Sir Joseph Swan.

PROFESSOR G. SERGI has been made president for the International Congress of Psychology to be held at Rome from April 26 to 30 of the present year.

LIEUTENANT-COLONEL A. KEOUGH has been appointed director general of the British Army Medical Service.